Paper No. 25

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte CAIFANG YIN AND
JASPER H. FIELD

Appeal No. 2001-2443
Application 09/108,541

HEARD: SEPTEMBER 18, 2002

Before WARREN, PAWLIKOWSKI, and MOORE, Administrative Patent Judges.

MOORE, Administrative Patent Judge.

DECISION ON APPEAL

This is an appeal under 35 U.S.C. § 134 from the Examiner's final rejection of claims 1 - 24, all of the claims of this application.

CLAIMS

Claims 1, 11, and 20 are representative of the claims on appeal and read as follows:

1. A method for bleaching a kraft brown stock pulp in a multi-stage elemental chlorine-free bleach sequence which comprises treating the brown stock as the first bleaching stage in the sequence with an initial alkaline extraction stage assisted by oxygen or oxygen and peroxide (E_O or E_{OP}) before a first chlorine dioxide stage (D_1) in an $E_OD_1E_{OP}D_2$ or $E_{OP}D_1E_{OP}D_2$ bleaching sequence which produces a bleach plant effluent which that is not recycled to a recovery boiler, wherein pulp from the D_1 and D_2 stages is washed after the stages to produce a D_1 and D_2 stage filtrate containing chlorides and pulp from the initial E_O or initial E_{OP} stage is washed after the stage to produce an initial E_O or initial E_{OP} stage filtrate and wherein at least a portion of the D_1 and/or D_2 stage filtrate is treated and the consistency of the brown stock entering the initial E_O or E_{OP} stage is reduced by recycling the D_1 and/or D_2 stage filtrate to the initial E_O or initial E_{OP} stage and mixing the recycled D_1 and or D_2 stage filtrate with brown stock entering the initial E_O or initial E_{OP} stage so that treated D_1 and/or D_2 stage filtrate is incorporated within the initial E_O or initial E_{OP} stage filtrate which in turn is ultimately incorporated into the bleach plant effluent and thereby not recycled to the recovery boiler, whereby the bleach plant effluent has a substantially reduced AOX, COD and color relative to such effluent in the absence of such recycling.

11. A process for bleaching a kraft brown stock pulp in a multi-stage elemental chlorine-free bleach sequence wherein the pulp has a consistency in the range of from about 25% to about 30% and a pH in the range of from about 3 to about 11 which comprises treating the brown stock pulp as the first bleaching stage in a bleaching sequence with an initial alkaline extraction stage assisted by oxygen or oxygen and peroxide (initial E_O or initial E_{OP} stage) before a first chlorine dioxide stage (D_1) in an $E_OD_1E_{OP}D_2$ or $E_{OP}D_1E_{OP}D_2$ bleaching sequence which produces a bleach plant effluent that is not recycled to a recovery boiler, wherein pulp from the first chlorine dioxide stage D_1 is washed in a pulp washer to produce a D_1 stage filtrate containing chlorides, and pulp from the initial E_O or initial E_{OP} stage is washed after the stage to produce an initial E_O or initial E_{OP} stage filtrate, and at least a portion of the D_1 stage filtrate is treated and the consistency of the brown stock entering the initial E_O or initial E_{OP} stage is reduced by recycling the D_1 stage filtrate to the initial E_O or E_{OP} stage and mixing the D_1 stage filtrate with brown stock entering the initial E_O or initial E_{OP} stage so that the treated D_1 stage filtrate is incorporated with the initial E_O or initial E_{OP} stage filtrate which is in turn incorporated within the bleach plant effluent and thereby nor recycled to the recovery boiler, substantially all filtrates from later bleaching and extraction stages being recycled to earlier stages of the bleaching sequence and ultimately incorporated with the bleach plant effluent and thereby not recycled to a recovery boiler.

20. A pulp bleaching process for reducing total bleach plant effluent volume which comprises treating a kraft brown stock pulp having a consistency of from about 20 to about 30% by weight and a Kappa number greater than about 25 for softwood and greater than about 15 for hardwood as the first bleaching stage of an elemental chlorine-free bleaching bleach sequence in an initial alkaline extraction stage assisted by oxygen or oxygen and peroxide (initial E_O or initial E_{OP} stage) before a first chlorine dioxide stage (D_1) in an $E_OD_1E_{OP}D_2$ or $E_{OP}D_1E_{OP}D_2$ bleaching sequence which produces a bleach plant effluent that is not recycled to a recovery boiler, wherein pulp is washed after the D_1 stage, after the D_2 stage, and after the E_{OP} stage to provide filtrates, at least a portion of filtrate from the D_2 stage contains chlorides and is recycled to a washer for the E_{OP} stage for washing pulp after the E_{OP} stage to produce an E_{OP} stage filtrate, at least a portion of the E_{OP} stage filtrate is recycled to the D_1 stage for washing pulp after the D_1 stage to produce a D_1 stage filtrate containing chlorides, and at least a portion of the D_1 stage filtrate is recycled to brown stock entering the initial E_O or initial E_{OP} stage and mixed with the brown stock to adjust the consistency of the brown stock entering the initial E_O or initial E_{OP} stage to from about 5 to about 10 wt.% and to effect treatment of the D_1 stage filtrate, and wherein pulp is washed after the initial E_O or initial E_{OP} stage to produce an initial E_O or initial E_{OP} stage filtrate containing chlorides from at least the D_1 stage filtrate mixed with brown stock entering the initial E_O or initial E_{OP} stage, the filtrate of which is in turn ultimately incorporated within the bleach plant effluent and thereby not recycled to the recovery boilers.

THE REFERENCES

In rejecting the appealed claims under 35 U.S.C. §103(a), the Examiner relies on the following references:

Maples et al. (Maples)	5,853,535	Dec. 29, 1998 (filed Nov. 7, 1994)
Carles et al. (Carles)	4,274,912	Jun. 23, 1981
Farley	3,719,552	Mar. 6, 1973
Samuelson	3,843,473	Oct. 22, 1974

Ibister et al., “The Closed Cycle Concept Kraft Mill at Great Lakes - An Advanced Report,” Pulp & Paper Canada, June 1979, pp. T174-180 (Ibister).

Li et al., “The Effects of Alkaline Leaching on Pulp Bleachability and Physical Properties,” Tappi, J., Vol. 76, No. 12, pages 159 - 166, Dec. 1993 (Li).

THE REJECTIONS

Claims 1-24 stand rejected under 35 U.S.C. §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which the Applicants regard as the invention.

Claims 1, 7, 8, 9, 11-13, 17, and 18 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Maples in view of Carles or Ibister with or without Li.

Claims 2-4, 6, 10, 15, 16, 19-24 are rejected under 35 U.S.C. §103(a) as being unpatentable over Maples in view of Carles or Ibister with or without Li, further in view of Farley.

Claims 5 and 14 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Maples in view of Carles or Ibister with or without Li, further in view of Samuelson.

GROUPING OF CLAIMS

The Appellants have separately argued claims 11 and 20. Accordingly, we will address claims 1, 11, and 20 separately. The remaining dependent claims stand or fall together with their independent claims. See In re Dance, 160 F.3d 1339, 1340 n.2, 48 USPQ2d 1635, 1636 n.2 (Fed. Cir. 1998); 37 CFR §1.192(c)(7)(1999).

DISCUSSION

Procedural Matters

We note that the Appellants appear to have filed a Supplemental Appeal Brief on October 27, 2000. (Reply Brief, page 1, footnote 1). A copy of the Supplemental Appeal Brief was provided to us via facsimile on September 24, 2002, after the oral hearing, is attached hereto, and made of record.

The Invention

The Appellants' invention relates to a process for the elemental chlorine-free bleaching of pulp in a four-stage bleaching process. The first stage is conducted under alkaline extraction conditions assisted by either oxygen or oxygen and peroxide. The second is a chlorine dioxide bleaching stage. The third is an alkaline extraction stage assisted by both oxygen and peroxide. The fourth and final stage is another chlorine dioxide stage. (Appeal Brief, page 3, lines 7-14).

Filtrate containing chlorinated wastes from one or both of the chlorine dioxide stages is recycled to the initial extraction stage where the pulp is delignified. Filtrate from the initial stage is then incorporated into the bleach plant effluent which is not recycled to a recovery boiler. (Appeal Brief, page 3, lines 15 - 22).

This process is said to result in several advantages including treatment of chloride-containing filtrate without expensive chloride-removal measures; substantially reduced AOX, COD and color in the bleach plant effluent; substantially reduced filtrate volumes; and recycled chlorine dioxide stage filtrate added to brown stock for reducing pulp consistency. Pulp strength and brightness is said to be good after the process. (Appeal Brief, page 4, lines 5 - 15).

The Rejection Under 35 U.S.C. § 112, Second Paragraph

Claims 1-24 stand rejected under 35 U.S.C. §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which the Applicants regard as the invention. The Examiner has found that the term "extraction stage" is misdescriptive of the first stage, which he considers to be a

bleaching/delignification stage rather than an extraction stage as is conventionally used in the art. (Examiner's Answer, page 4, lines 4 - 14).

As set forth in Amgen Inc. v. Chugai Pharmaceutical Co., Ltd., 927 F.2d 1200, 1217, 18 USPQ2d 1016, 1030 (Fed. Cir. 1991):

> The statute requires that "[t]he specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention." A decision as to whether a claim is invalid under this provision requires a determination whether those skilled in the art would understand what is claimed. See Shatterproof Glass Corp. v. Libbey-Owens Ford Co., 758 F.2d 613, 624, 225 USPQ 634, 641 (Fed. Cir. 1985)(Claims must "reasonably apprise those skilled in the art" as to their scope and be "as precise as the subject matter permits")

The Applicant has used the term "extraction" in his claims in reference to the initial extraction stage and a second extraction stage ($E_{O \text{ or } OP}D_1E_{OP}D_2$). Extraction is a commonly understood term requiring the withdrawal or removal of a substance by chemical or physical processes. See, e.g., Webster's New Collegiate Dictionary, (c) 1979, pp. 403, a copy of which is attached to this opinion. It includes, e.g. solubilization and removal of chlorinated lignins [delignification], removal of hemicellulose pentosan from fibers, saponification of fatty acids and rosin acids in pulp, etc. (See Appeal Brief, page XXXX, line XXXX). The Examiner's concerns notwithstanding, it is abundantly clear that extraction is required by the first and third steps in the bleaching process and accordingly claims 1, 11, and 20 are not indefinite.

The Examiner further finds claim 1 to be indefinite in the use of the term "the stage" at line 8 is inconsistent with the use of the term "the stages", and in line 10, where EP is inconsistent with Eop. (Examiner's Answer, page 4, lines 14-16).

We disagree with the Examiner regarding the term "extraction stage". The Appellants are utilizing the term in the singular to refer to either the initial E_O or E_{OP} stage. We see no inconsistency in referring back to each "stage" individually instead of in the plural.

We further disagree with the Examiner regarding the inconsistency of the claims involving the typographical errors. The Appellants filed a set of original claims with this application on July 1, 1998. They additionally filed a preliminary amendment on July 1, 1998 which amended the original claims. However, when filing the amendment of August, 1999 (Paper No. 7), at least one typographical error was introduced into the claim body, but not by amendment of record.

Claim 1, line 10 incorrectly recited EP when the claim, as amended by the preliminary amendment recited "E_{OP}."

Claim 11, line 14 appears to have been amended correctly to recite "E_O" in Paper No. 7, page 2, line 19. However, the Appeal Brief incorrectly recites this term as "$_{EO}$".

As this rejection is founded on an erroneous factual basis, we shall reverse it.

The Rejection of Claims 1, 7, 8, 9, 11-13, 17, and 18 Under 35 U.S.C. §103(a)

Claims 1, 7, 8, 9, 11-13, 17, and 18 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Maples in view of Carles or Ibister with or without Li.

The Examiner has found that Maples teaches an EO-D-EOP-D bleach sequence wherein the first stage is an alkaline extraction and delignification stage, the second stage is a chlorine dioxide bleach stage, the third stage is an extraction stage enhanced with oxygen and peroxide, and the final stage is a chlorine dioxide bleach stage. (Examiner's Answer, page 5, lines 5-8). The Examiner further notes that Maples

teaches counter current recycling the effluent to lower color, AOX, and COD through the bleach stages (Examiner's Answer, page 5, lines 10-12). The Examiner then concludes it would have been obvious to recycle the chlorine dioxide effluent to the oxidative extraction stages as being taught by Carles or Ibister and further to lower the water and steam consumption (Examiner's Answer, page 5, lines 12-16).

Initially, we note that the Examiner bears the initial burden, on review of the prior art or on any other ground, of presenting a prima facie case of unpatentability. If that burden is met, the burden of coming forward with evidence or argument shifts to the applicant. In re Oetiker, 977 F.2d 1443, 1445, 24 USPQ2d 1443, 1444 (Fed. Cir. 1992). Where the Examiner fails to establish a prima facie case, the rejection is improper and will be overturned. In re Fine, 837 F.2d 1071, 1074, 5 USPQ2d 1596, 1598 (Fed. Cir. 1988)

The Appellants point out that their claims preclude recycling the filtrates to a recovery boiler. (Reply Brief, page 7, lines 21-25, page 8, lines 3-6). They further point out that the principal reference, Maples teaches recovery of the chloride by recycling the filtrates to a recovery boiler (Reply Brief, page 8, line 7 - page 9, line 37). Finally, they note that Maples does not teach mixing D_1 and/or D_2 stage filtrate with the brown stock entering the initial extraction phase. (Reply Brief, page 11, lines 17-20)

We agree with the Appellants. We are unable to find where the Examiner has pointed to a teaching in the Maples, Carles, Ibister, or Li references which would lead one of ordinary skill in the art to the process as claimed; specifically: (1) to prohibit recovering the filtrate by a conventional recovery boiler, and (2) to recycle the filtrate from the D_1 and/or D_2 stages, mix it with the brown stock, and subject the mixture to the

initial stage E_O or E_{OP} extraction. These essential steps in the claims are not discussed by the Examiner, nor are they apparent from a review of the references.

Accordingly, we reverse this rejection.

The Rejection of Claims 2-4, 6, 10, 15, 16, and 19-24 Under 35 U.S.C. §103(a)

Claims 2-4, 6, 10, 15, 16, 19-24 are rejected under 35 U.S.C. §103(a) as being unpatentable over Maples in view of Carles or Ibister with or without Li, further in view of Farley.

As the Farley reference does not correct the deficiencies of the rejection above, we reverse this rejection for the same reasons noted above.

The Rejection of Claims 5 and 14 Under 35 U.S.C. §103(a)

Claims 5 and 14 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Maples in view of Carles or Ibister with or without Li, further in view of Samuelson.

As the Samuelson reference does not correct the deficiencies of the first rejection discussed above, we reverse this rejection for the same reasons noted in the discussion of the first rejection above.

Summary of Decision

The rejection of claims 1-24 under 35 U.S.C. §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which the Applicants regard as the invention, is reversed.

The rejection of claims 1, 7, 8, 9, 11-13, 17, and 18 under 35 U.S.C. §103(a) as being unpatentable over Maples in view of Carles or Ibister with or without Li is reversed.

The rejection of claims 2-4, 6, 10, 15, 16, 19-24 under 35 U.S.C. §103(a) as being unpatentable over Maples in view of Carles or Ibister with or without Li, further in view of Farley, is reversed.

The rejection of claims 5 and 14 under 35 U.S.C. §103(a) as being unpatentable over Maples in view of Carles or Ibister with or without Li, further in view of Samuelson, is reversed.

REVERSED

CHARLES F. WARREN Administrative Patent Judge	)
BEVERLY A. PAWLIKOWSKI Administrative Patent Judge	) BOARD OF PATENT) APPEALS AND
JAMES T. MOORE Administrative Patent Judge	) INTERFERENCES

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